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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/740,205	12/18/2003	Krishnaswamy Ramkumar	5298-08101 PM01039D	2236
35617	7590	03/22/2005	EXAMINER	
DAFFER MCDANEIL LLP			PHAM, HOAI V	
P.O. BOX 684908			ART UNIT	
AUSTIN, TX 78768			PAPER NUMBER	
			2814	

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/740,205

Applicant(s)

RAMKUMAR ET AL.

Examiner

Hoai v. Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17, 18 and 20-37 is/are pending in the application.
- 4a) Of the above claim(s) 28 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 17, 18 and 20-22 is/are allowed.
- 6) ☒ Claim(s) 23-27, 29-31 and 33-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of embodiment 2 in the reply filed on 1/3/2005 is acknowledged.

Claim Objections

2. Claim 27 is objected to because of the following informalities:

Line 1, after "comprises" delete --a--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 23, 25-27, 29, 31 and 33-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Kunikiyo [U.S. Pat. 6,661,065] previously applied.

With respect to claim 23, Kunikiyo (fig. 21, cols. 22-23) discloses a semiconductor topography, comprising:

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a silicon-oxide-nitride-oxide-silicon (SONOS) structure (1, gate insulating film ONO, 13) (see col. 14, lines 26-28 and col. 23, lines 1-5); and

a nitride layer (162) comprising deuterium arranged above the SONOS structure (see col. 23, lines 6-14).

With respect to claims 25, 27, 33 and 35, Kunikiyo discloses a silicon-oxide-nitride-oxide-silicon structure (see col. 22, lines 66-67 and col. 23, line 1) comprising an oxide layer (111) arranged upon a silicon-based semiconductor substrate (1), wherein an interface between the silicon-based semiconductor substrate and the oxide layer comprises deuterium (see col. 19, lines 13-16).

With respect to claim 26 and 34, Kunikiyo discloses that the SONOS structure comprises a deuterium nitride layer (col. 23, lines 1-5).

With respect to claims 29 and 31, Kunikiyo discloses that at least one but less than all the layers of the SONOS structure (1, gate insulating film ONO, 13) comprise deuterium (see col. 14, lines 26-28 and col. 23, lines 1-5).

With respect to claim 36, Kunikiyo discloses that a nitride layer (162) comprising deuterium arranged above the ONO structure (see col. 23, lines 6-14).

5. Claim 31 is rejected under 35 U.S.C. 102(e) as being anticipated by Eklund [U.S. Pat. 6,114,734] Applicant IDS.

Eklund (fig. 3, col. 2) discloses a semiconductor topography comprising an oxide-nitride-oxide (ONO) structure (300, 310, 280), wherein at least one but less than all the layers of the ONO structure comprise deuterium.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 23-27, 29-32 and 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eklund [U.S. Pat. 6,114,734] Applicant IDS, in view of Kunikiyo [U.S. Pat. 6,661,065] previously applied.

With respect to claims 23, 30, 31 and 36, Eklund (fig. 3, cols. 2-5) discloses a semiconductor topography, comprising:

a silicon-oxide-silicon (SOS) structure (200, 210, 220);

a nitride layer (310) comprising deuterium arranged above the SOS structure;

and

a deuterated dielectric spacer (230) interposed between the sidewalls of the SOS structure and the nitride layer (310).

Eklund does not disclose a gate insulating film (210) comprising of ONO structure. However, Kunikiyo discloses that the ONO structure can be used for the gate insulating film (see col. 23, lines 1-5). Therefore, it would have been obvious to the skilled in the art to use the ONO structure for forming the gate insulating film as taught by Kunikiyo into the device of Eklund because the ONO structure gate insulating film would provide the known purpose of reducing the leakage current.

With respect to claims 25, 27, 33 and 35, Kunikiyo discloses a silicon-oxide-nitride-oxide-silicon structure (see col. 22, lines 66-67 and col. 23, line 1) comprising an oxide layer (111) arranged upon a silicon-based semiconductor substrate (1), wherein an interface between the silicon-based semiconductor substrate and the oxide layer comprises deuterium (see col. 19, lines 13-16).

With respect to claim 26 and 34, Kunikiyo discloses that the SONOS structure comprises a deuterium nitride layer (col. 23, lines 1-5).

With respect to claims 29 and 31, Kunikiyo discloses that at least one but less than all the layers of the SONOS structure (1, gate insulating film ONO, 13) comprise deuterium (see col. 14, lines 26-28 and col. 23, lines 1-5).

With respect to claims 24 and 37, Eklund discloses that a dielectric layer (280) comprises deuterium arranged above the nitride layer (310) (see col. 2, lines 58-62).

Allowable Subject Matter

8. Claims 17, 18 and 20-22 are allowed.

Response to Arguments

9. Applicant's arguments with respect to newly claims 23-27, 29-31 and 33-37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v. Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HOAI PHAM
PRIMARY EXAMINER